

REMARKS

The enclosed is responsive to the Examiner's Office Action mailed on July 12, 2007. At the time the Examiner mailed the Office Action claims 21-22, 24-26, 29-35, and 37-40 were pending. By way of the present response the Applicants have: 1) amended claims 21, 24-26, 31, 34, and 37-38; 2) added claim 41; and 3) canceled claims 22-23 and 27-28. As such, claims 21, 24-26, 29-35, and 37-41 are now pending. Applicants respectfully request reconsideration of the present application and the allowance of all claims now presented.

Summary of Examiner Interview

Applicants thank Examiner for conducting a telephone interview on October 22, 2007, with Applicants' representatives Bret Winterle and Brian Lambert regarding this application. The objection to the drawings and proposed amendments to claims 21, 31, 34, and 37 were discussed. No agreement was reached with Examiner, and Examiner indicated an additional search may be required.

Objection to the Drawings

37 CFR 1.83(a)

The drawings stand objected to under 37 CFR 1.83(a) as not showing every feature specified in the claims. More specifically, the drawings are objected to for not showing transducers positioned along the entire length of the housing, as in claims 24, 26, and 38. Applicants respectfully submit that a

drawing showing transducers positioned along the entire length of the housing is not required. MPEP 608.02 states that "35 U.S.C 113 requires a drawing to be submitted upon filing where such drawing is necessary for the understanding of the invention." (emphasis added). The original specification at page 7, lines 27-28, states, "Naturally, the transducers 22 may be positioned along the entire length of the housing 24..." Hence, the original specification describes the feature of the claims with enough clarity so as to enable one skilled in the art to implement the feature. As a result, Applicants respectfully request the removal of all 37 CFR 1.83(a) objections.

Claim Rejections

35 U.S.C. 102(b) Rejections

Claims 21, 29, 31-32, 37, and 39 stand rejected under 35 U.S.C. 102(b) as being anticipated by John, Jr. et al., U.S. Patent No. 4,966,177 (hereinafter "John, Jr."). In reference to independent claims 21 and 31, Applicants respectfully submit that John, Jr. does not teach or suggest all of the features of the claim. For example, John, Jr. does not at least describe (1) a housing wherein an opening is configured to receive an assembled irradiated nuclear fuel assembly or (2) an ultrasonic omnidirectional transducer comprising a first end, a second end, and a rod disposed between wherein the first end and the second end are attached to a housing.

John, Jr. describes a system for cleaning fuel tubes one at a time. See column 5, lines 19-23. The present action states that a fuel assembly includes a disassembled fuel assembly. Page 5, lines 5-7. Applicants have amended the

claims to define a fuel assembly as an assembled fuel assembly. John, Jr. does not describe receiving an assembled fuel assembly.

An "assembled irradiated nuclear fuel assembly" is supported by the specification. For example, 24 of Figure 4, Figure 7, Figure 8a, Figure 9, and Figure 11 illustrate an assembled fuel assembly.

John, Jr. also describes transducers being attached to the bottom wall of the cleaning tank receptacle. See column 4, lines 50-52. The transducers 46 (illustrated in Figure 3) as described by John, Jr. are not configured to emanate omnidirectional waves, are not attached to a housing at two ends of the transducer, and do not include a rod. The present action states that ultrasonic waves are inherently omnidirectional. Present Action, page 4, paragraph 1. Applicants respectfully disagree. The transducers described by John, Jr. emit an energy wave in one general direction (i.e., from the emitting side of the transducer). A directional wave is not omnidirectional. Since John, Jr. does not describe all of the features of the claims, claims 21 and 31 overcome all 35 USC 102 rejections in reference to John, Jr..

In reference to independent claim 37, Applicants respectfully submit that John, Jr. does not teach or suggest all of the features of the claim. For example, John, Jr. does not at least describe (1) a housing wherein an opening is configured to receive an assembled irradiated nuclear fuel assembly or (2) an ultrasonic omnidirectional transducer configured to emanate an ultrasonic omnidirectional wave with a node spacing of an approximate multiple of the spacing between the fuel rods of said assembled irradiated nuclear fuel assembly. As previously shown, since John, Jr. describes receiving fuel rods one at a time, John, Jr. cannot describe a housing to receive an assembled

irradiated nuclear fuel assembly. As previously stated, John, Jr. does not describe omnidirectional waves.

Furthermore, John, Jr. cannot describe a node spacing of the ultrasonic omnidirectional wave being the spacing between fuel rods since only one fuel rod is loaded at a time. Thus, since John, Jr. does not describe all of the features of the claim, claim 37 overcomes all 35 USC 102 rejections based on John, Jr.. Since claims 29, 32, and 39 depend from independent claims 21, 31, or 37, Applicants respectfully submit that claims 29, 32, and 39 also overcome all 35 USC 102 rejections based on John, Jr.

In presenting the 35 USC 102 rejections, the present action objects that apparatus claims are replete with statements that are either essentially method limitations or statements of intended or desired use, including, "for cleaning an irradiated nuclear fuel assembly," "to be at least as long as an irradiated nuclear fuel assembly to be received by said elongated housing," and "to emanate omnidirectional ultrasonic energy waves having a node structure that is an approximate multiple of a spacing between fuel rods." Present Action, page 4, paragraph 2. Applicants respectfully submit that the elements of the presented apparatus claims are structural in nature.

For example, "for cleaning an irradiated nuclear fuel assembly" is part of the preamble. Furthermore, "to be at least as long as an assembled irradiated nuclear fuel assembly" is a structural limitation. In addition, "configured to emanate omnidirectional ultrasonic energy waves having a node structure that is an approximate multiple of a spacing between fuel rods" describes the configuration of the apparatus.

Claims 29, 31-32, 37, and 39 further stand rejected under 35 U.S.C. 102(b) as being anticipated by McNeer, U.S. Patent No. 4,071,376 (hereinafter "McNeer"). In reference to independent claims 21 and 31, Applicants respectfully submit that McNeer does not teach or suggest all of the features of the claim. For example, McNeer does not at least describe an ultrasonic omnidirectional transducer comprising a first end, a second end, and a rod disposed between wherein the first end and the second end are attached to a housing.

McNeer describes a ring 20 of transducers 18 in a housing 12 for cleaning a cask. See Column 2, Lines 51-55. See also Figures 2 and 3. McNeer describes the ring 20 of transducers as a free standing piece separate from the housing 12. Hence, the transducers are not attached to the housing. In addition, McNeer describes transducers that emit directional waves, not omnidirectional waves. For at least these reasons, McNeer does not describe all of the features of claims 21 and 31.

In reference to independent claim 37, Applicants respectfully submit that McNeer does not teach or suggest all of the features of the claim. For example, McNeer does not at least describe an ultrasonic omnidirectional transducer configured to emanate an ultrasonic omnidirectional wave with a node spacing of an approximate multiple of said spacing between the fuel rods of said assembled irradiated nuclear fuel assembly. As previously stated, McNeer does not describe an omnidirectional wave. In addition, McNeer describes cleaning of a cask 10, which has a solid surface. Since the cask to be cleaned has a solid surface, McNeer is only concerned with the amount of power required using unmodulated waves to effectively clean the cask. Column 3, lines 1-18 and lines 48-58. Hence, McNeer does not at least describe an ultrasonic omnidirectional wave with a node spacing of an approximate multiple of said spacing between

the fuel rods of said assembled irradiated nuclear fuel assembly. For at least these reasons, McNeer does not describe all of the features of claim 37.

Since McNeer does not describe all of the features of claims 21, 31, and 37, Applicants respectfully submit that claims 21, 31, and 37 overcome all 35 USC 102 rejections based on McNeer. Since claims 29, 32, and 39 depend from independent claims 21, 31, or 37, Applicants respectfully submit that claims 29, 32, and 39 also overcome all 35 USC 102 rejections based on McNeer.

Claims 21, 29, 31-32, 37, and 39 further stand rejected under 35 U.S.C. 102(b) as being anticipated by Fields et al., U.S. Patent No. 4,372,787 (hereinafter "Fields"). In reference to independent claims 21 and 31, Applicants respectfully submit that Fields does not teach or suggest all of the features of the claims. For example, Fields does not at least describe an ultrasonic omnidirectional transducer comprising a first end, a second end, and a rod disposed between wherein the first end and the second end are attached to a housing.

Fields describes a tub for cleaning radiators where transducers are placed on the bottom of the tub. As in McNeer and John, Jr., the described transducers emit directional waves, not omnidirectional waves, and do not include a rod. Furthermore, the described transducers are not attached at two ends to the housing. For at least these reasons, Fields does not describe all of the features of claims 21 and 31.

In reference to independent claim 37, Applicants respectfully submit that Fields does not teach or suggest all of the features of the claim. For example, Fields does not at least describe an ultrasonic omnidirectional transducer configured to emanate an ultrasonic omnidirectional wave with a node spacing of an approximate multiple of the spacing between the fuel rods of said assembled

irradiated nuclear fuel assembly. As previously stated, Fields describes transducers that emit directional waves, not omnidirectional waves. In addition, Fields describes the cleaning of a radiator and is therefore not concerned with rod spacing affecting the node spacing of the ultrasonic wave. Therefore, Fields does not describe all of the features of claim 37.

Since Fields does not describe all of the features of claims 21, 31, and 37, Applicants respectfully submit that claims 21, 31, and 37 overcome all 35 USC 102 rejections based on Fields. Since claims 29, 32, and 39 depend from independent claims 21, 31, or 37, Applicants respectfully submit that claims 29, 32, and 39 also overcome all 35 USC 102 rejections based on Fields.

Claims 21, 29, 31-32, 37, and 39 further stand rejected under 35 U.S.C. 102(b) as being anticipated by Minoru et al., Japanese Patent No. 9,220,545 (hereinafter "Minoru"). In reference to claims 21 and 31, Applicants respectfully submit that Minoru does not teach or suggest all of the features of the claims. For example, Minoru does not at least describe an ultrasonic omnidirectional transducer comprising a first end, a second end, and a rod disposed between wherein the first end and the second end are attached to a housing. Minoru illustrates six transducers, each configured to emit an ultrasonic wave in a different direction from the other five transducers. The six transducers are intended to clean the six sides of an object. The transducers in Minoru, though, emit directional waves, not omnidirectional. In addition, the transducers in Minoru do not include a rod and are not attached at two ends to the housing. For at least these reasons, Minoru does not describe all of the features of claims 21 and 31.

In reference to claim 37, Applicants respectfully submit that Minoru does not teach or suggest all of the features of the claims. For example, Minoru does not at least describe an ultrasonic omnidirectional transducer configured to emanate an ultrasonic omnidirectional wave with a node spacing of an approximate multiple of the spacing between the fuel rods of said assembled irradiated nuclear fuel assembly. As previously stated, the transducers of Minoru emit directional waves, not omnidirectional. Minoru also does not describe an ultrasonic omnidirectional wave with a node spacing of an approximate multiple of the spacing between the fuel rods of said assembled irradiated nuclear fuel assembly since Minoru does not describe cleaning assembled irradiated nuclear fuel assemblies. For at least these reasons, Minoru does not describe all of the features of claim 37.

Since Minoru does not describe all of the features of claims 21, 31, and 37, Applicants respectfully submit that claims 21, 31, and 37 overcome all 35 USC 102 rejections based on Minoru. Since claims 29, 32, and 39 depend from independent claims 21, 31, or 37, Applicants respectfully submit that claims 29, 32, and 39 also overcome all 35 USC 102 rejections based on Minoru.

For at least the above reasons, Applicants respectfully submit that claims 21, 29, 31-32, 37, and 39 overcome all 35 USC 102 rejections.

35 U.S.C. 103(a) Rejections

Claims 21, 29, 31-32, 37 and 39 stand rejected under 35 U.S.C. 103(a) as being unpatentable over John, Jr., McNeer, or Fields, in view of the article by Jeffrey Hilgert, "Specifying an Ultrasonic Cleaning System," Metal Finishing, April

1997 (hereinafter "Hilgert"). As previously stated for claims 21, 31, and 37, John, Jr., McNeer, and Fields do not describe all of the features of the claims.

The present action states that Hilgert teaches that ultrasonic transducers generate omnidirectional waves. Present Action, page 13, paragraph 3. Applicants respectfully submit that Hilgert teaches ultrasonic cleaning is omnidirectional, not an ultrasonic wave. See page 54, column 2, first full paragraph: "Ultrasonic cleaning generates a number of specific advantages for the user. Because it is based on sound, it is omnidirectional." (emphasis added). Ultrasonic cleaning is omnidirectional because waves continually reflect off surfaces in order to cover spaces not initially covered by where the wave is originally directed. In describing transducers, Hilgert describes transducers that emit directional waves. For example, figure 5 of Hilgert illustrates a transducer that emits a directional wave. For at least these reasons, Hilgert does not teach or suggest any claim features of claims 21, 31, and 37 not taught by John, Jr., McNeer, or Fields, nor is there motivation to combine any of these references with Hilgert.

Since any combination of John, Jr., McNeer, Fields, and Hilgert does not teach or suggest all of the features of the claims, Applicants respectfully submit that claims 21, 31, and 37 overcome all 35 USC 103 rejections. Since claims 29, 32, and 39 depend from independent claims 21, 31, or 37, Applicants respectfully submit that claims 29, 32, and 39 also overcome all 35 USC 103 rejections.

Claims 30, 33, and 40 stand rejected under 35 U.S.C. 103(a) as being unpatentable over John, Jr., McNeer, Fields, or Minoru in view of Kato et al., U.S. Patent No. 5,467,791 (hereinafter "Kato") or Richardson et al., U.S. Patent No. 5,377,237 (hereinafter "Richardson"), either alone or in combination.

As previously stated for claims 21, 31, and 37, John, Jr., McNeer, and Fields do not describe all of the features of the claims. Applicants respectfully submit that neither Kato nor Richardson teaches any of the features of claims 21, 31, and 37 not taught by John, Jr., McNeer, Fields, or Minoru. Since claims 30, 33, and 40 depend from independent claims 21, 31, or 37 and any combination of John, Jr., McNeer, Fields, Minoru, Kato, and Richardson does not describe all of the features of the independent claims, Applicants respectfully submit that claims 30, 33, and 40 overcome all 35 USC 103 rejections.

Claims 24 and 28 stand rejected under 35 U.S.C. 103(a) as being unpatentable over John, Jr., McNeer, Fields, or Minoru. Since claims 24 and 28 depend from independent claim 21 and claim 21 overcomes all 35 USC 103 rejections, Applicants respectfully submit that claims 24 and 28 overcome all 35 USC 103 rejections.

Claims 25 and 26 stand rejected under 35 U.S.C. 103(a) as being unpatentable over John, Jr., McNeer, Fields, or Minoru in view of Walter et al., U.S. Patent No. 5,200,666 (hereinafter "Walter"). As previously stated for claim 21, John, Jr., McNeer, and Fields do not describe all of the features of the

claims. Referring to Walter, Applicants respectfully submit that Walter does not describe an ultrasonic omnidirectional transducer comprising a first end, a second end, and a rod disposed between wherein the first end and the second end are attached to a housing. Walter describes a threaded stud on one end of an ultrasonic transducer "to mount it on the wall of a container." Column 2, lines 48-49. See also 2 of Figures 1-2 The other end of the transducer in Walter is specifically illustrated as being without such mounting means in order for the end to "extend[] into the liquid in the container." Column 1, lines 16-17. Since Walter does not describe all of the untaught features of claim 21 and claims 25 and 26 depend from independent claim 21, claims 25 and 26 overcome all 35 USC 103 rejections.

Claims 34 and 35 stand rejected under 35 U.S.C. 103(a) as being unpatentable over Minoru in view of Kato or Richardson, either alone or in combination. In reference to independent claim 34, Applicants respectfully submit that none of Minoru, Kato, and Richardson teaches or suggests all of the features of the claims as described above. For example, Minoru, Kato, and Richardson do not at least describe a plurality of ultrasonic omnidirectional transducers, wherein each comprises a rod configured to emanate omnidirectional ultrasonic energy waves. In addition, no motivation exists to combine Minoru, Kato, or Richardson. Since Minoru, Kato, and Richardson do not describe all the features of claim 24, Applicants respectfully submit that claim 24 overcomes all 35 USC 103 rejections. Since claim 25 depends from

independent claim 24, Applicants respectfully submit that claim 25 also overcomes all 35 USC 103 rejections.

37 CFR 112 Rejections

The present action states that the claims are rejectable under 37 CFR 112, second paragraph, for reciting subcombinations of an apparatus in the preamble and reciting combinations of the fuel assembly and the apparatus in the elements of the claims. Applicants respectfully submit that the presently presented claims do not claim a combination of the fuel assembly and the apparatus in the elements of the claims. References to a fuel assembly are used to provide structure for an apparatus, or the flow of a method. Applicants respectfully submit that antecedent basis for the assembled fuel assembly has been amended so as to remove any confusion as to what is being claimed in the elements of the claims. Therefore, Applicants respectfully submit that the present claims overcome all 37 CFR 112, second paragraph, rejections.

Newly Added Claims

Claim 41 is new. Claim 41 depends from independent claim 31. Since claim 31 overcomes all rejections, Applicants respectfully submit that claim 41 is allowable.

For at least the above reasons, Applicants respectfully submit that all rejections have been overcome and that all pending claims are in condition for allowance.

CONCLUSION

If there are any additional charges, please charge them to our Deposit Account Number 16-1435. If a telephone conference would facilitate the prosecution of this application, Examiner is invited to contact Brian K. Lambert at (336) 607-7357.

Respectfully Submitted,

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